

The item of greatest interest in the above quotation is that regarding the possibility of a partial vacuum existing in connection with the periphery of the whirl, and the suggestion that it may be sufficiently low to cause explosive effects. In reply to a query as to whether the

identical, Mr. Miller offers the comment below, with Figure 3 in illustration of it. The possibility that such a condition may accompany tornadoes has, it is believed, not hitherto been suggested, and is therefore presented for the consideration of our readers:

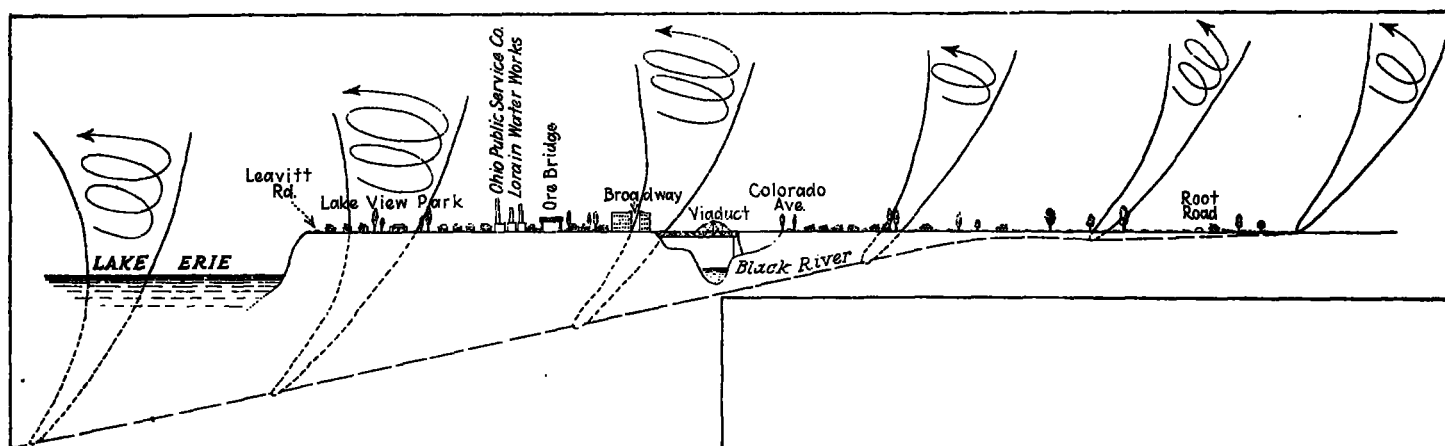


FIG. 2.—Diagrammatic cross sections of the Lorain tornado, showing relation of decreasing area at the earth's surface to the rise of the funnel cloud. (Reproduced by courtesy of the Engineering News Record)

types of structural failure in both the central partial vacuum and the border area were so far identical as to indicate practical certainty that the causes were also

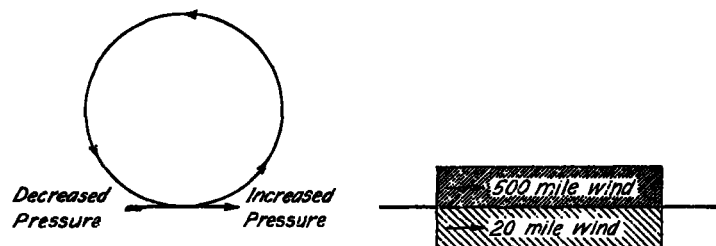


FIG. 3.—Conditions of wind and pressure in relation to the suggested partial vacuum at edge of tornado. (C. C. Miller)

Referring to the print, Figure A [not reproduced. It depicts damage by outward bulging of walls.—B. M. V.] shows the method in which the houses were damaged on the outer edge and also in the center. The walls were bulged outward or blown completely out, showing of course the presence of a vacuum. * * * There were a large number of houses damaged in the same manner along the edges of the storm's path. It does not seem to me that a vacuum at the outer edge of the storm's path would be unusual or impossible. If there is a condition which would produce an increased pressure, there would also exist an area in which the pressure would be decreased. The cause of the vacuum in the center of the storm is of course due to the centrifugal force, and the outer vacuum, I believe, is due to the difference in velocity of the two volumes of wind. Figure 3 shows * * * a condition which would be favorable for a vacuum along the line which separates the two winds traveling at a different rate of speed. I would believe that if a vacuum really exists on the outer edge of the storm, that it would necessarily be very narrow.

NOTES, ABSTRACTS, AND REVIEWS

SOLAR AND TERRESTRIAL RADIATION ¹⁰

By A. ÅNGSTRÖM

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551.52(048)

Continuous records of the total radiation received from the sun and sky have been obtained at Stockholm since July, 1922. From these the annual and daily variation of the radiation received may be obtained, and as the direct solar radiation may be computed from the time of sunshine, the variation, both of the direct and the diffused radiation, is known. The total amount of radiation received during the day, Q_s , may be expressed in the form: $Q_s = Q_0 (0.25 + 0.75S)$, if Q_0 is the amount on a perfectly clear day, and S is the time of sunshine expressed as a fraction of the greatest possible time. The total radiation received is a minimum in the afternoon of days when the sky is less than half-covered with cloud, and a

maximum in the afternoon of overcast, or nearly overcast, days; this is due to the operation of convection.

The nocturnal radiation has been measured at stations where the temperature ranged from -30°C. to $+30^\circ \text{C.}$ The results obtained show that the radiation from a black surface at a temperature between these limits may be divided into three groups of waves: (1) About 25 per cent of the radiation passes through the atmosphere without absorption, and is independent of the thickness of the atmosphere and the amount of water vapor it contains; (2) about 50 per cent is totally absorbed by a thin layer of the atmosphere, probably in the lowest 30 meters at ordinary vapor pressures; (3) about 25 per cent is subjected to a variable absorption, depending chiefly on the amount of water vapor present.—A. W. L.

¹⁰ Roy, Met'l Soc. Jour., April, 1924, 50: 121-126. Report to the International Commission for Solar Research on Actinometric Investigations of Solar and Atmospheric Radiation.